

REMARKS/ARGUMENTS

Claims 1-12 were pending in the present application. The present response does not amend, cancel, or add any new claims, leaving pending in the application claims 1-12. Reconsideration of the rejected claims is respectfully requested.

I. Rejection under 35 U.S.C. §103

Claims 1-12 are rejected under 35 U.S.C. §103(a) as being obvious over *Kennedy* (US 6,788,722). Applicants' claim 1 requires a laser defined by:

a waveguide block having a least one waveguide channel formed therein;
a lasing gas including carbon dioxide within said waveguide channel; and
a laser resonator having a resonator axis extending through said waveguide channel;
said waveguide block being located between electrodes arranged to energize said lasing gas such that laser radiation is generated in said laser resonator; and
wherein at least the channels of said waveguide block are formed substantially from a beryllium oxide ceramic material, and said laser radiation has a wavelength between about 9.2 and 9.7 micrometers

(*emphasis added*). Such limitations are not rendered obvious by *Kennedy*.

Kennedy teaches a high power waveguide laser, wherein the power of the laser is adjusted by controlling the shape and dimensions of the waveguide channel(s) (col. 9, line 40, col. 11, line 26). *Kennedy* teaches the use of a ceramic waveguide (col. 13, lines 6-9; col. 13, lines 20-28), and teaches that "typical CO₂ laser waveguide materials are alumina (Al₂O₃), aluminum (Al), Pyrex, oxide glass compounds, and beryllium (BeO)" as these materials are "strongly absorbent at the IR wavelengths emitted by CO₂ lasers (i.e., 9μm to 11μm)" (col. 6, lines 4-8). *Kennedy* does not make any distinction between these materials, or teach any advantages thereof.

As stated in the present application, "wavelengths between about 9.2μm and 9.7μm are particularly useful for laser drilling in printed circuit board (PCB) materials," but the average power output for a pulsed CO₂ laser operating at these wavelengths is "significantly less than for the same laser operating at 10.6μm" (page 1, lines 23-28). It is also stated that when operating at more common wavelengths, "the BeO material did not appear to provide any significant increase in output power compared with the output power of a similarly configured laser having waveguides in an alumina ceramic slab" (page 6, lines 12-15). When combined with the fact that "the cost of a BeO slab having waveguide channels machined therein may be as much [as] three to five times higher than the cost of an alumina slab of the same size and having the same

number and configuration of waveguide channels therein," (page 6, lines 20-25) there would have been no motivation for the inventors in *Kennedy* (including common inventors with the present application) to use the more expensive BeO material to obtain (expectedly) similar results. It was only at a later time that these inventors discovered the unexpected results that using a BeO waveguide in a particular configuration as described and claimed in the present application can provide "a 40 to 50% increase in average power output" (p. 6, lines 23-25).

As such, the invention of claim 1, and dependent claims 2-11, would not be obvious in light of the teachings of *Kennedy*. Claim 12 contains similar limitations and would also not be obvious in light of *Kennedy*. Applicants therefore respectfully request that the rejection with respect to claims 1-12 be withdrawn.

II. Conclusion

In view of the above, it is respectfully submitted that the application is now in condition for allowance. Reconsideration of the pending claims and a notice of allowance is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency in the fees filed, asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 50-1703, under Order No. COHO-5150. **A duplicate copy of the transmittal cover sheet attached to this Response to Office Action Mailed September 29, 2005, is provided herewith.**

Respectfully submitted,

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